CUSTOMER NO.: 24498
Serial: 09/819,554
Amdt. dated October 14, 2004
Reply to Office Action of July 14, 2004

PATENT
PF010030

REMARKS

Claims 1-9 are pending in this application.

Rejection of claims 1 – 5 and 7 - 9 under 35 U.S.C. 103(a)

Claims 1 – 5 and 7 - 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (U.S. 6,573,945) in view of Dieterich (U.S. 6,233,278) for the reasons stated in the Office Action.

The present claimed invention recites a process and device for the MPEG type video coding of high definition images wherein the image is split into panels and an encoder is assigned to each panel. Two or more panels constitute, over the length of the image, a horizontal band of the image. A rate control is implemented at a band level as a function of a preset bit rate for the band. Each encoder of the band takes into account a same Video Buffering Verifier (VBV) calculated for the whole band. Independent claims 1 and 7 each include similar limitations to those discussed above.

The present claimed invention is directed to implementing the rate control algorithm of each coder at a band level by using a same virtual buffer. This global VBV buffer takes into account global data, i.e. data concerning the whole band. The coding of the panels which make up a band is made at a band level and not at a panel level. Therefore, instead of having constraints specific to each coder, one single constraint exists for the entire band. This single constraint relates to the same Video Buffer Verifier. This constraint for the band is consecutively reduced as it is no longer an aggregation of constraints from each coder dedicated to the band (overflow can be compensated by underflow) thereby allowing improvement of the coding image quality.

On the other hand, Wu et al. disclose an encoder and encoding method for inserting logos into a digital television signal. The logo insertion is performed at the front end of the encoder (e.g., prior to compression) by sharing the video capture frame buffer of the encoder, so there is no need for a separate logo inserter with a separate buffer thereby reducing encoding costs. An alpha blending function receives logo

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image and logo alpha map data for blending with input video data. The input video is retrieved from the frame buffer, and written back to the frame buffer after blending with the logo data. Subsequently, the frame buffer contents are provided to a pre-processing function for filtering and film mode detection. For a film mode frame, a drop field decision is provided from the pre-processing function to the frame buffer to drop the redundant field. The pre-processed video data is then provided for conventional compression processing. In an HDTV embodiment, several compressors are provided which each receive a panel of a video frame.

Furthermore, Wu et al. disclose an image split (110) into panels and processing of each panel (122) is performed through video compressors as can be seen in Figure 1 thereof. The Master controller controls the flow of data and coordinates and synchronizes the video compressors. Therefore, Wu et al. neither nor suggest "MPEG type video coding...wherein a rate control is implemented at a band level as a function of a preset bit rate for the band" as in the present claimed invention. Additionally, Wu et al. neither disclose nor suggest "each encoder of the band taking into account a same Video Buffering Verifier (VBV) calculated for the whole band" as in the present claimed invention.

Additionally, the Examiner in the current Office Action stated that Wu et al. disclose the VBV of the present invention and cites Figure 1, element 140 for support of this contention. However, in the previous Office Action dated November 5, 2003, Examiner clearly and explicitly states that Wu et al. does not disclose the VBV of the present invention and cited a different reference in combination with Wu et al. in order to produce the present claimed invention. This combination was Appealed and as stated by the Examiner, the previous arguments were considered persuasive. Applicants respectfully submit, that similarly to the Examiner's prior admissions, Wu et al. neither disclose nor suggests "a same Video Buffering Verifier (VBV) calculated for the whole band" as in the present claimed invention. The Examiner cites element 140 of Wu et al. in support of his revised contention that Wu et al. disclose a VBV. However, as stated in column 2, lines 55 – 61, element 140 is a mere video buffer and "the compression engines 120 – 127 dump the compressed video data into the video

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buffer 140." Thus, it is clear that element 140 is a buffer for storing data therein and is not "a same Video Buffering Verifier" as in the present claimed invention. Specifically, it is clearly claimed in claims 1 and 7 that the VBV is "calculated". Therefore, a value that is calculated cannot possibly be equivalent to a video buffer where video data is dumped as disclosed by Wu et al.

Dieterich discloses a method an apparatus for pre-processing an image sequence to extract side information concerning the image sequence. The side information is inserted into the image sequence, such that upon being coded at a later time, the encoder can utilize the side information to best select one or more coding parameters.

The Examiner cites column 14 of Dieterich for disclosing the "rate controller/bit budget for video buffer" of the present claimed invention. Applicants respectfully disagree. Dieterich neither discloses nor suggests that "a rate control is implemented at a band level as a function of a preset bit rate for the band, each encoder of the band taking into account a same Video Buffering Verifier (VBV) calculated for the whole band" as in the present claimed invention. Rather, Dieterich discloses the calculation of a bit budget at a stripe, slice or row level (preanalysis) and rate control at this same level (line 21-24). However, the bit budget control calculation in Dieterich merely corresponds to a statistical multiplexing such as the one described on page 7, lines 4-7 of the present specification. A bit rate is calculated for each horizontal band of the image, during a preanalysis stage, and a different bit rate is allocated accordingly for each of the bands (page 8, lines 4-8). The bit budget calculation disclosed by Dieterich is not equivalent to "each encoder of the band taking into account a same Video Buffering Verifier (VBV) calculated for the whole band" as in the present claimed invention.

Furthermore, in Dieterich, this bit allocation is performed at a lower level than in the present claimed invention wherein the allocation is performed at the image level. By performing the bit allocation at a level lower than the image level, the purpose the invention disclosed by Dietrich is to better control overflow or underflow because it allocates more accurately the available bit budget for the image. That is to say that the dispatching of the bit allocation within the image reduces the overflow/underflow risk.

7

CUSTOMER NO.: 24498
Serial: 09/819,554
Amdt. dated October 14, 2004
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PATENT
PF010030

However, this bit allocation is <u>not</u> a global regulation as in the present claimed invention. Specifically, the bit allocation in Dietrich would result in a first bit allocation for a first slice of the image and a second bit allocation for the following slice. This bit allocation would prevent the allocations in both slices from compensating one another. Thus, Dieterich neither discloses nor suggests "a rate control is implemented at a band level as a function of a preset bit rate for the band, each encoder of the band taking into account a same Video Buffering Verifier (VBV) calculated for the whole band" as in the present claimed invention.

Additionally, the statistical multiplexing or rate control at lower level in Dieterich is not equivalent to "each encoder is coupled to another encoder of the same band for exchanging coding data in order to implement a global rate control at a band level through a same Video Buffering Verifier (VBV) for said band" as claimed in claim 7 of the present invention.

Applicants further respectfully submit that the there is no motivation or reason to combine the invention disclosed by Wu et al. with the invention as disclosed by Dieterich. Specifically, the system disclosed by Wu et al. is intended for inserting logo information into a HD video signal whereas the system disclosed by Dieterich relates to extracting side information concerning the image sequence which allows the encoder to better select coding parameters. The objectives and motivation for producing the inventions disclosed by Wu et al. and Dieterich are unrelated and there is no common problem recognition, motivation or other reason for modifying the systems of the cited references to produce the claimed arrangement. Consequently, it is respectfully submitted that there is no reason why one skilled in the art of MPEG type coding devices as in the present claimed invention would combine these references to solve the problems for which the present claimed invention was developed.

Furthermore, applicants respectfully submit that even should Wu et al. and Dieterich be combined any invention resulting from this combination would not result in the present claimed invention. Rather, such a combination would produce a logo insertion apparatus including a splitter for splitting a video stream into panels which outputs video data to a video buffer wherein a logo is overlapped into predetermined

8

CUSTOMER NO.: 24498
Serial: 09/819,554
Amdt. dated October 14, 2004
Reply to Office Action of July 14, 2004

PATENT
PF010030

frames of the video that is stored in the video buffer and that utilizes statistical multiplexing to calculate the bit budget of a stripe slice or row. This combination is not equivalent to the present claimed invention. Both Wu et al. and Dieterich disclose management at an image level and <u>not</u> at a band level as in the present claimed invention. Thus, any combination of Wu et al. with Dieterich does not produce "a rate control is implemented at a band level as a function of a preset bit rate for the band, each encoder of the band taking into account a same Video Buffering Verifier (VBV) calculated for the whole band" as in the present claimed invention.

In view of the above remarks, it is respectfully submitted that claims 1 and 7 are patentable over of Wu et al. when taken alone or in combination with Dieterich. Additionally, it is respectfully submitted that as claims 2 – 5 are dependent on claim 1 and claims 8 and 9 are dependent on claim 7, claims 2 – 5 and 8 - 9 are also patentable for the same reasons as discussed above regarding claims 1 and 7. It is thus further respectfully submitted that this rejection is satisfied and should be withdrawn.

In view of the above remarks, it is respectfully submitted that claims 1-9 are in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicants' attorney at the phone number below, so that a mutually convenient date and time for a telephonic interview may be scheduled.

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No fee is believed due with this response. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,

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Patricia M. Fedorowycz

10